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| 10/064,727 | 08/09/2002 | Robert Freedman | 20.2760 | 4236 |

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| EXAMINER | |
|---|---|
| FETZNER, TIFFANY A | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2859 | |

DATE MAILED: 03/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

CT

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/064,727 | FREEDMAN, ROBERT | |
| | Examiner | Art Unit | |
| | Tiffany A. Fetzner | 2859 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *21 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-24 and 28-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10-12,14 and 28-32* is/are rejected.

7)☒ Claim(s) *9, 13, and 15-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 August 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *03/22/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED Non-final ACTION

### *Information Disclosure Statement*

1. The information disclosure statement (IDS) submitted on 03/22/2004 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the examiner has considered the information disclosure statement.

### *Claim Objections*

2. **Claims 5, 10 16, 20, 21, 22, 23, 24**, and **29** are objected to because of the following informalities:

**A)** With respect to **Claims 5, 10, 16, 20, 21, 22, 23, 24**, the term "formation fluids" lacks antecedent basis because applicant has removed this feature from **Amended independent claim 1**, and **Amended independent claim 14** as per the December 21st 2004 amendment and response. Appropriate correction is required.

**B)** With respect to **Claims 29** the term "borehole" lacks antecedent basis because applicant has removed this feature from **Amended independent claim 14** as per the December 21st 2004 amendment and response. Appropriate correction is required.

### *Canceled Claims*

3. **Claims 25, 26**, and **27** are canceled as per applicant's December 21st 2004 amendment and response.

### *Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 1-5, 8, 10, 11,12,** and **30** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Lew et al.**, US patent 4,785,245 issued November 15th 1988.

6. With respect to **Amended Claim 1**, **Lew et al.,** teaches " A method for making formation evaluation determinations, comprising: acquiring a nuclear magnetic resonance measurement of an earth formation" [See col. 15 lines 8-18; col. 15 line 68 through col. 16 line 29; and col. 3 line 44 through col. 4 line 8; where FID's and spin-

echo NMR measurements along with spin-spin (i.e. t2) and spin-lattice (i.e. t1) NMR signal times are acquired from the **Lew et al.,** device which is installed "in an oil well flow line" See also col. 3 lines 59-68 and the abstract.] **Lew et al.,** also teaches that oil is a dielectric medium, [See col. 1 line 68 and the entire **Lew et al.,** reference which concerns determining / acquiring an accurate measurement for the total oil fraction in an oil well flow line, that comprises oil, water, gas and soil (i.e. earth formation) elements. [See abstract, and col. 3 line 44 through col. 4 line 8] The examiner notes that oil is a dielectric medium, and the **Lew et al.,** reference teaches an apparatus / method that actually detects and measures only oil fraction in the mixture. [See col. Col. 16 lines 4-6; col. 15 lines 8-18] **Lew et al.,** also teaches "acquiring a dielectric measurement of the earth formation;" because the **Lew et al.,** reference measures the amplitude of the RF signal from the dielectric medium of oil directly, since almost none (i.e. no significant amount of NMR rf emission from water is detected) of the aqueous component contributes to the detected signal, the amplitude measurement(s) of the oil emission is / are a "dielectric measurement"(s). [See col. 15 line 62 through col. 16 line 29; col. 13 lines 41-50; col. 1 lines 67-68; col. 4 line 50 through col. 5 line 2] **Lew et al.,** also teaches "determining an oil volume fraction of the earth formation from a combination of the nuclear magnetic resonance measurement" (i.e. the NMR signals) "and the dielectric measurement." (i.e. preferably the initial amplitude of the RF emission. [See col. 3 line 44 through col. 16 line 29; abstract, as this limitation is a main principle of the entire **Lew et al.,** reference.]

7. With respect to **Claim 2**, **Lew et al.,** teaches "the nuclear magnetic resonance measurement comprises at least one spin echo amplitude." [See col. 16 lines 22-29] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

8. With respect to **Claim 3**, **Lew et al.,** teaches that "the acquiring the nuclear magnetic resonance measurement uses" an initial "polarization time sufficiently long so that nuclear spins are substantially polarized", because **Lew et al.,** teaches exposing a material to a strong constant magnetic field so that statistically many of (ie substantially all of) the nuclei magnetic moments become oriented parallel to the z-axis, (i.e. become

substantially polarized). The examiner notes that using a strong magnetic field, to expose a material so that many, or all of the nuclei magnetic moments, become oriented parallel to the z-axis, is a teaching of "a polarization time sufficiently long so that nuclear spins are substantially polarized". [See col. 8 lines 3-15; col. 9 line 66 through col. 10 line 17; col. 11 lines 45-61.] The same reasons for rejection, which apply to **claims 1, 2** also apply to **claim 2** and need not be reiterated.

9. With respect to **Claim 4**, **Lew et al.,** teaches/shows that "the dielectric" (i.e. the oil) "measurement comprises an electromagnetic wave phase shift" because the excitation flipping / tipping / rotating / nutating of the magnetization from the z-axis to the x, y plane, for conducting the oil measurement, is a change in the phase of the magnetization. The phases of various nuclei are shown in Figures 5a through 5g. The phase shifts are viewable by taking figures 5a through 5g in combination. The FID(s) or the spin-echo signal(s) which is / are detected by **Lew et al.,** is / are a result of the "electromagnetic wave phase shift" caused by the excitation pulse, as the excited nuclei realign with the z-axis. [See figures 5a through 5g; col. 5 lines 59-64] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 4** and need not be reiterated.

10. With respect to **Claim 5**, **Lew et al.,** teaches that "the formation fluids" (i.e. see the lack of antecedent basis objection above, for the term "formation fluid") comprise" oil, or other hydrocarbons, water, gas, and soil components. [See abstract] The examiner notes that these fluids are also "fluids" which are found "in a formation traversed by a borehole drilled with a water-based drilling fluid", because the **Lew et al.,** device is designed for use specifically by the oil industry, to examine fluid in oil wells and pipelines. [See col. 1 lines 15-57; col. 3 lines 61-68] The examiner also notes that the **Lew et al.,** device is also designed to operate under high pressure conditions (i.e. downhole) as part of the fluid flow line, and to analyze any mixture of the above oil, or other hydrocarbons, water, gas, and soil components, [See abstract where the term "soil components" is broadly interpreted by the examiner to intrinsically include mud, sand, salt and brine. See also col. 7 lines 2-25; col. 15 lines 2-18]. The same reasons for rejection, that apply to **claim 1,** also apply to **claim 5** and need not be reiterated.

11. With respect to **Claim 10**, **Lew et al.,** teaches that "the formation fluids" (i.e. see the lack of antecedent basis objection above, for the term "formation fluids") "comprise at least one sample withdrawn from a formation traversed by a borehole", [See col. 6 line 4 through col. 7 line 25; col. 3 lines 60-68] **Lew et al.,** also teaches that "a sum of an oil volume fraction and a water volume fraction is taken to be one" because **Lew et al.,** teaches that by subtracting the fraction of water cut from the total volume fraction to determine the oil cut fraction, the prior art commits the basic fallacy of assuming that whatever is not water in the mixture is oil. [See col. 1 line 51 through col. 2 line 9] This teaching that the prior art assumes "whatever is not water is oil" is an equivalent way of stating that "a sum of an oil volume fraction and a water volume fraction is taken to be one". [See col. 1 line 51 through col. 2 line 9] The same reasons for rejection, that apply to **claim 1,** also apply to **claim 10** and need not be reiterated.

12. With respect to **Claim 11**, **Lew et al.,** teaches "determining a total volume of the formation fluids from the nuclear magnetic resonance measurement; determining the water volume fraction of the formation fluids from the dielectric measurement; and determining the oil volume fraction of the formation fluids by subtracting the water volume fraction of the formation fluids from the total volume of the formation fluids." [See col. 1 line 51 through col. 3 line 24] The same reasons for rejection, that apply to **claims 1, 10,** also apply to **claim 11** and need not be reiterated.

13. With respect to **Claim 8**, and corresponding **claim 12** which depend respectively from **claims 1,** and **10**, **Lew et al.,** teaches and shows that "the dielectric measurement comprises an electromagnetic wave attenuation", [See col. 2 line 40 through col. 3 line 10; col. 13 line 40 through col. 16 line 38; figures 4a through 6] Additionally, because the initial amplitude measurements are taken, by **Lew et al.,** compared to a 100% flowing sample of oil obtained under the same conditions, result in a deviation, the actual **Lew et al.,** dielectric measurement(s) is / are electromagnetic wave attenuated. The deviation is itself a representation of the "attenuation". [See also col. 14 line 48 through col. 15 line 18, abstract, col. 4 line 50 through col. 5 line 2 and col. 2 line 50 through col. 3 line 10]. The same reasons for rejection, that apply to **claims 1, 5, 10** also apply to **claims 8, 12** and need not be reiterated.

14. With respect to **Amended Claim 30**, **Lew et al.,** teaches "A method for determining a gas fractional volume in a gas-liquid sample", [See col. 1 lines 51-61; col. 3 line 44 through col. 5 line 39; col. 14 line 57 through col. 16 line 29] "comprising: acquiring a bulk density measurement of the gas-liquid sample;" [See col. 2 lines 27-39] "acquiring a nuclear magnetic resonance measurement of the gas-liquid sample;" [See col. 2 line 40 through col. 3 line 10] "and determining the gas fractional volume of the gas-liquid sample from a combination of the bulk density measurement and the nuclear magnetic resonance measurement" [See col. 2 line 27 through col. 3 line 10].

***35 USC 103 Rejections***

***Claim Rejections - 35 USC § 103***

15. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. **Claims 6-7, 14, 31,** and **32** are rejected under **35 U.S.C. 103(a)** as being unpatentable over by **Lew et al.**, US patent 4,785,245 issued November 15th 1988.

17. With respect to **Claim 6**, **Lew et al.,** lacks directly stating, but does suggest that the steps of "acquiring the nuclear magnetic resonance measurement and the acquiring the dielectric measurement are performed while drilling", because **Lew et al.,** teaches continuously or instantaneously detecting and measuring on a real-time basis the oil-cut and net amount of in a mixture of materials installed in an oil well flow line, gathering network line, or other flow pipe. [See col. 3 lines 44-68] These teachings suggest that the **Lew et al.,** device is installable in any oil well device, especially the logging-while-drilling tools which are conventionally used to measure and drill formation fluids on a real-time basis. The same reasons for rejection, that apply to **claims 1, 5,** also apply to **claim 6** and need not be reiterated.

18. With respect to **Claim 7**, **Lew et al.,** lacks directly teaching the term "porosity" therefore **Lew et al.,** also lacks directly teaching the exact terminology of "determining a water-filled porosity from the dielectric measurement; determining a total formation porosity from the nuclear magnetic resonance measurement; and determining an oil-filled porosity by subtracting the water-filled porosity from the total formation porosity". However, the examiner notes that **Lew et al.,** does teach and suggest these determinations in the description of the prior art techniques without explicitly using the term "porosity". [See col. 1 line 28 through col. 3 line 34 where the water measurements conducted with NMR techniques, to determine a total volume of the formation, and a bulk density of the total mixture suggest a "total formation porosity from the nuclear magnetic resonance measurement"; because by established conventional definition "porosity" is 'the ratio of the volume of interstices to the volume of its mass' and the fact that "density" measurements are conducted in addition to volume measurements implies the performing of a "total porosity measurement" and consequently the feature of "determining a total formation porosity from the nuclear magnetic resonance measurement".] The water-filled or water cut measurements in combination with the teachings of col. 1 line 28 through col. 3 line 34 also suggest a "water-filled porosity from the dielectric measurement;" **Lew et al.,** also teaches subtracting the water cut from the total to determine the oil cut. [See col. 2 lines 2-3] Therefore, it would have been obvious to one of ordinary skill in the art at the time that the invention was made that even though the term "porosity" itself is lacked by the reference the **Lew et al.,** reference also teaches and suggests "determining an oil-filled porosity by subtracting the water-filled porosity from the total formation porosity". The same reasons for rejection, that apply to **claims 1, 5,** also apply to **claim 7,** and need not be reiterated.

19. With respect to **Amended Claim 14**, **Lew et al.,** teaches "A method for <u>making formation evaluation determinations</u> ~~evaluating a volume of formation fluids~~, comprising: acquiring a nuclear magnetic resonance measurement <u>of an earth formation</u>;" [See col. 15 lines 8-18; col. 15 line 68 through col. 16 line 29; and col. 3 line 44 through col. 4 line 8; where FID's and spin-echo NMR measurements along with spin-spin (i.e. t2) and spin-lattice (i.e. t1) NMR signal times are acquired from the **Lew et al.,** device which is

installed "in an oil well flow line" See also col. 3 lines 59-68 and the abstract.] **Lew et al.,** also teaches that oil is a dielectric medium, [See col. 1 line 68 and the entire **Lew et al.,** reference which concerns determining / acquiring an accurate measurement for the total oil fraction in an oil well flow line, that comprises oil, water, gas and soil (i.e. earth formation) elements. [See abstract, and col. 3 line 44 through col. 4 line 8] The examiner notes that oil is a dielectric medium, and the **Lew et al.,** reference teaches an apparatus / method that actually detects and measures only oil fraction in the mixture. [See col. Col. 16 lines 4-6; col. 15 lines 8-18] **Lew et al.,** also teaches "acquiring a dielectric measurement of the earth formation;" because the **Lew et al.,** reference measures the amplitude of the RF signal from the dielectric medium of oil directly, since almost none (i.e. no significant amount of NMR rf emission from water is detected) of the aqueous component contributes to the detected signal, the amplitude measurement(s) of the oil emission is / are a "dielectric measurement"(s). [See col. 15 line 62 through col. 16 line 29; col. 13 lines 41-50; col. 1 lines 67-68; col. 4 line 50 through col. 5 line 2]

20. Additionally, **Lew et al.,** also teaches "acquiring a bulk density measurement of the earth formation;" [See col. 2 line 27 through col. 3 line 10] ~~and~~ "forming a set of linear response equations representing a reservoir fluid model; and solving a the set of linear response equations ~~representing a reservoir fluid model~~ to determine fractional fluid volumes of the earth formation" [See col. 1 lines 51 through col. 2 line 9 where determining the fractional amount of each component by separating the components, measuring each component and subtracting each non-oil amount from the total volume amount is the step of "forming a set of linear response equations representing a reservoir fluid model; and solving the set of linear response equations to determine fractional fluid volumes of the earth formation". **Lew et al.,** also teaches performing this step "from a combination of the nuclear magnetic resonance measurement", (i.e. the NMR signals) "and the dielectric measurement." (i.e. preferably the initial amplitudes of the RF emissions). [See col. 3 line 44 through col. 16 line 29; in combination with the abstract], "and the bulk density measurement." [See col. 2 line 27 through col. 3 line 10]

21. With respect to **Claim 31**, **Lew et al.,** teaches "computing a density from the bulk density measurement and a fluid density", [See col. 2 line 27 through col. 3 line 10] and wherein the determining the gas fractional volume is performed using the density and the nuclear magnetic resonance measurement" [See col. 2 line 27 through col. 3 line 10; col. 1 lines 51-61; col. 3 line 44 through col. 5 line 39; col. 14 line 57 through col. 16 line 29]. **Lew et al.,** lacks directly teaching the term "porosity" therefore as in the rejection of **claim 7**, **Lew et al.,** lacks directly teaching "computing a density porosity from the bulk density measurement and a fluid density and wherein the determining the gas fractional volume is performed using the density porosity and the nuclear magnetic resonance measurement", by exact terminology however, a gas density porosity is suggested by **Lew et al.,** because the **Lew et al.,** reference determines both volume and mass for the components present in a multi-component fluid regardless of whether the sample is liquid/gas liquid/liquid liquid/solid, gas/liquid/solid, gas/liquid/liquid etc., therefore It would have been obvious to one of ordinary skill in the art at the time that the invention was made that "porosity" measurement for gas components are also a part of the **Lew et al.,** reference.

22. With respect to **Amended Claim 32**, **Lew et al.,** teaches "A method for making formation evaluation determinations" (i.e. traversed by a well or pipeline) [See col. 1 line 6 through col. 16 line 29, abstract], "comprising: acquiring a dielectric measurement of an earth formation;" [See col.. 1 line 68, and col. 3 line 44 through col. 16 line 29, as determining a true measurement of the dielectric oil is a main goal of the **Lew et al.,** reference. **Lew et al.,** also teaches "determining a dielectric-derived water volume of the earth formation from the dielectric measurement"; [See also col. 13 lines 41-50 where any component fraction or component cut (i.e. water, oil or gas) respectively is determined by 'comparing the maximum amplitude of the NMR emission from a volume of the mixture when the maximum amplitude of the NMR emission from an equal volume of 100% of the material exposed to the same NMR conditions'.] "the dielectric acquiring a suite of nuclear magnetic resonance measurements of the earth formation;" [See figure 6, col. 3 line 44 through col. 16 line 29,] "deriving a water volume of the earth formation and an apparent heavy oil volume of the earth formation from the

nuclear magnetic resonance measurements;" [See the **Lew et al.,** teachings of what is already known from the prior art of col. 1 line 27 through col. 3 line 24] "and comparing the dielectric-derived water volume" (i.e. the water-cut volume obtained by the **Lew et al.,** method) "with the nuclear magnetic resonance derived water volume" (i.e. the NMR water volume determination known from the **Lew et al.,** teachings of what is already known from the prior art) "and the apparent oil volume" (i.e. the NMR oil volume determination known from the **Lew et al.,** teachings of what is already known from the prior art is an apparent oil volume) "to produce a true heavy oil volume" (ie the volume oil cut which is the result of the **Lew et al.,** device when the material desired to be detected is oil) "of the earth formation". [See the teachings of the entire **Lew et al.,** reference taken in combination with one another, with all figures and the abstract.]

23. **Lew et al.,** lacks directly teaching the exact terminology of an "apparent oil volume". However, it would have been obvious to one of ordinary skill in the art at the time that the invention was made that in the description of the known prior art techniques that the basic fallacy assumption of the prior art that "whatever is not water in the mixture is oil" results in the prior art technique's oil cut as being an "apparent oil volume" cut.

24. **Claims 28** and **29** are rejected under **35 U.S.C. 103(a)** as being unpatentable over by **Schoen et al.**, US patent 6,686,736 B2 issued February 3rd 2004, filed August 13th 2001 with an effective US provisional priority date of August 30th 2000.

25. With respect to **Amended Claim 28**, **Schoen et al.**, teaches and claims "A method for making formation evaluation determinations ~~evaluating a formation traversed by a borehole~~, comprising: acquiring a nuclear magnetic resonance measurement of an earth formation; [See col. 16 lines 22-64; and col. 1 line 15 through col. 16 line 20 in general] "acquiring a dielectric measurement of the earth formation;" [See col. 16 lines 22-64; and col. 1 line 15 through col. 16 line 20 in general. The examiner notes that the resistivity and conductivity measurements are types of dielectric measurements related to the porosity and permittivity of an earth formation by the relationships taught in the **Schoen et al.**, reference. See col. 1 line 26 through col. 16 line 20] "and determining a rock-matrix travel time associated with the earth formation" [See col. 6 line 33 through

col. 7 line 29 where resistivities both horizontally and vertically over the depth and thickness of the formation for each layer (i.e. the rock matrix) for multiple frequencies and wavelengths are acquired from "a combination of the nuclear magnetic resonance measurement and the dielectric measurement" [See col. 16 lines 29-33, and figures 4a and 4B].

26. The **Schoen et al.**, reference lacks directly teaching the term "rock matrix" however It would have been obvious to one of ordinary skill in the art at the time that the invention was made that the measurements made at each layer of the earth formation are a "rock matrix".

27. With respect to **Amended Claim 29**, **Schoen et al.**, teaches "determining a rock-matrix travel time log as a function of 'borehole' depth" because the thickness of the formation comprised of one or more layers corresponds to the depth of the formation. [See antecedent objection to borehole terminology above.] The same reasons for rejection, and obviousness, that apply to **claim 28** also apply to **claim 29** and need not be reiterated.

***Allowable Subject Matter***

28. **Claims 9**, **13**, and **15-24** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and amended to overcome the antecedent basis objections with respect to **claims 15**, **16, 20, 21, 22, 23**, and **24**. [See specifically the antecedent objections to **claims 15**, **16, 20, 21, 22, 23**, and **24** under objected claims].

29. With respect to **Claim 13**, the prior art of record fails to teach the combinational limitation of "calculating a salinity of a brine in the sample based on a total volume of the formation fluids and a known aqueous phase attenuation function ***with respect to the salinity and a fluid temperature***".

30. With respect to **Claim 9**, the prior art of record fails to teach and suggest all the features of **claim 9**, because **claim 9** also requires the salinity calculation specified by objected to **claim 13**.

31. With respect to **Claim 15**, the prior art of record fails to teach and suggest the entire combination that "the reservoir fluid model comprises a representation of a non-gas bearing formation, the fractional fluid volumes comprise a water volume fraction, an oil volume fraction, and an oil-based mud filtrate volume fraction, and the set of linear response equations comprises: a nuclear magnetic resonance response equation that defines a total volume of the formation fluids with respect to the oil volume fraction, the water volume fraction, and the oil-based mud filtrate volume fraction; *a dielectric response equation that defines an electromagnetic wave travel time with respect to the oil volume fraction and oil travel time, the water volume fraction and a water travel time, and the oil-based mud filtrate volume fraction and an oil-based mud filtrate travel time*; and a density response equation that defines the bulk density with respect to an oil density and the oil volume fraction, a water density and the water volume fraction, and an oil-based mud filtrate density and the oil-based mud filtrate volume fraction.

32. **Claims 16-21** are objected to because they depend from objected to **claim 15**. [See also the antecedent objection to **claims 15**, **16, 20, 21, 22, 23**, and **24**]

33. With respect to **Claim 22**, the prior art of record fails to teach and suggest the entire combination that "the reservoir fluid model comprises a representation of a gas-bearing formation, the fractional fluid volumes comprise a gas volume fraction, a water volume fraction, and a gas-corrected total volume, and the set of linear response equations comprises: an nuclear magnetic resonance response equation that defines the total volume of the formation fluids with respect to the gas volume fraction, a water volume fraction, and a gas-corrected total volume; *a dielectric response equation that is adapted for the gas-bearing formation by defining an electromagnetic wave travel time with respect to the gas volume fraction and a gas travel time, the water volume fraction and a water travel time, and the gas-corrected total volume and a gas-corrected travel time; and a density response equation that is adapted for the gas-bearing formation by defining the bulk density measurement with respect to the gas volume fraction and a gas density, the water volume fraction and a water density, and the gas-corrected total volume and a gas-corrected total density.*

34. **Claims 23-24** are objected to because they depend from objected to **claim 22**.

## Conclusion

35. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

36. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

Tiffany A. Fetzner for 3.2.05

TAF
March 1, 2005

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800